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(54) Title: HEAP LEACH BIO OXIDIZATION

(57) Abstract: A method for biologically heap leaching ore within a greenhouse.

PATENT APPLICATION

HEAP LEACH BIO OXIDIZATION

Treatment of refractory base and precious metal ore requires expensive crushing, milling, and flotation followed by pyrometalurgical reduction.

BRIEF DESCRIPTION OF THE DRAWING

The drawing, no scale, shows a transverse cross section of a loaded biologocal oxdization heap leach pad.

The launder, rehandling equipment. precipitate colunm(s), pulp collection and pumping equipment and second leach pad for receiving the laundered, unoxdizied ore are not showen.

Alternatively, the launder could consist of a Variable Capacity Improved Rand Leases Plane Table having a very small grooves, for example minus 40 mesh.

The table could then discharge extracted concentrate directly into the precipitate columns.

Applicant's patent application 08/864,698, Variable Capacity Improved Rand Leases Plane Table is hereby incorporated into this application by reference.

DETAILED DESCRIPTION OF THE DRAWING

#1 is the clear plastic, 10 mil plus, green house membrane providing for entrance of sunlight, retention of humidity, elevation of temperature and control of liquid process volumes in the necessary out door enviornment.

#2 is one branch of the perforated, small diameter, high preasure plastic irrigation pipe line from the intermitently timed pump, #7.

The support systems for #1&2 may be intergral from the ore stockpile, #3, heaped surface.

#4 is the self draining asphaultic concrete leach pad which is built with an apposite transverse and longitudinal grade so that all leach solution eventually drains to the pump's sump, #6.

Asphaultic concrete is used for the leach pad as this material is reletively unaffected by an acidic solution and can withstand movement of heavy equipment thereby enabling a final clean-up of oxidized ore with a rubber tired front end loader.

#5 is an air vent at the skirt of the clear plastic green house membrane for entrance of oxygen.

CLAIMS

I Claim:

I.) A method for biologically heap leaching ore within a green house.

II.) The green house of calim 1 which comprises a clear plastic membrane over the top of said heap.

III.) The method of claim 1 which comprises recirculating irrigation.

IV.) The method of calim 1 which further comprises an asphaultic concrete heap leach pad.

V.) Laundering bio oxdized heap leach ore.

VI.) Column preciptation of bio oxdized heap leach pulp.

VII.) A method for production of trivalent arsenic which comprises bio oxdizing refractory ore within a green house.

VIII.) The method of claim 7 which further comprises column preciptation.

IX.) Laundering oxdized ore over a minus 40 mesh variable capacity improved rand leases plane table for extraction of a pulp heavy mineral concentrate.

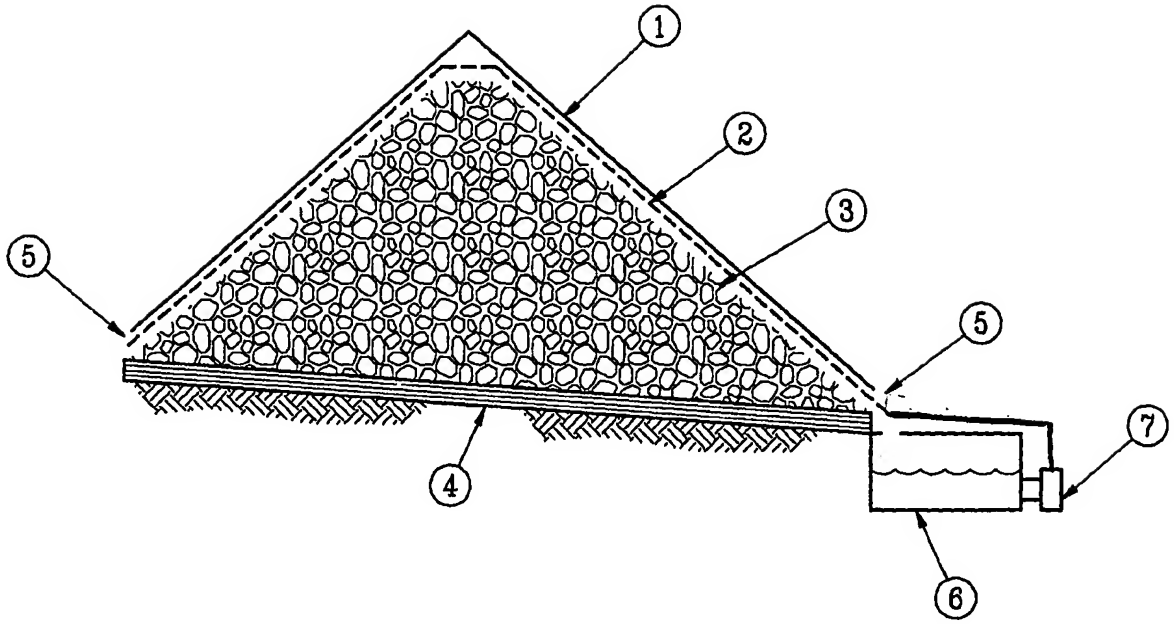

FIGURE A

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB00/00928

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :C22B 3/18, 30/04
US CL : 75/743; 423/658.5, 87
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 75/743; 423/658.5, 87

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST
search terms: greenhouse, leach, metal, arsenic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,E -- Y,E	US 6,159,270 A (RASKIN et al) 12 December 2000, column 14, lines 38-40.	1 -- 2, 3
X	US 4,992,179 A (BRIERLEY et al) 12 February 1991, column 4, lines 64 and 65.	5, 6
Y	US 5,917,117 A (ENSLEY et al) 29 June 1999, column 6, line 41 and column 7, lines 29-32.	7
A	US 5,928,406 A (SALT et al) 27 July 1999, column 4, line 29, see Claims	7
A	US 5,785,735 A (RASKIN et al) 28 July 1998, see Claims	1-9

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

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